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In the Claims

Claims 1-7 (canceled)

2 ~~8~~. (previously amended) The method of Claim ~~34~~<sup>1</sup>, wherein said purified nucleic acid sequence comprises the sequence between nucleotides 284 to 1477 of the sequence set forth in SEQ ID NO: 1 or the complement thereof.

Claims 9-31 (canceled)

32. (currently amended) A method for screening substances capable of modulating the potassium current of a functionally equivalent derivative of a purified TWIK-related arachidonic acid-activated potassium channel protein (“TRAAK potassium channel protein”) protein which comprises:

(a) transferring a purified nucleic acid sequence ~~or encoding~~ a functionally equivalent derivative of SEQ ID NO: 2 having four transmembrane segments and two P domains, wherein said functionally equivalent derivative is activated by arachidonic acid, thereof that encodes the TRAAK potassium channel protein, into a cellular host;

(b) culturing the host under conditions for expression of TRAAK potassium channel protein;

(c) reacting selected amounts of the substance to be screened with the cellular host; and

(d) measuring the electrophysiological effect current of the substance to be screened on a the TRAAK potassium channel's protein's current expressed by the cellular host, wherein an increase or decrease in potassium current indicates modulation of activation of said TRAAK potassium channel protein.

33. (currently amended) The A method of Claim 32, wherein said functionally equivalent derivative is SEQ ID NO: 4, for screening substances capable of modulating the potassium current of a purified TWIK-related arachidonic acid-activated protein ("TRAAK potassium channel protein") which comprises:

- ~~\_\_\_\_\_ (a) \_\_\_\_\_ transferring a purified nucleic acid sequence that encodes the TRAAK potassium channel protein into a cellular host;~~
- ~~\_\_\_\_\_ (b) \_\_\_\_\_ culturing the host under conditions for expression of TRAAK potassium channel protein;~~
- ~~\_\_\_\_\_ (c) \_\_\_\_\_ reacting selected amounts of the substance to be screened with the cellular host; and~~
- ~~\_\_\_\_\_ (d) \_\_\_\_\_ measuring the current of the substance to be screened on a potassium channel's current expressed by the cellular host.~~

34. (currently amended) A method of screening substances capable of modulating the potassium current of an isolated purified TWIK-related arachidonic acid-activated potassium channel (TRAAK) protein which comprises:

- (a) transferring a purified nucleic acid sequence <sup>the TRAAK protein of SEQ ID NO: 2</sup> ~~represented by encoding SEQ ID No. 4~~ <sup>^</sup> 2, that which encodes the TRAAK protein, into a cellular host;
- (b) culturing the host under conditions for expression of <sup>said</sup> TRAAK protein;
- (c) reacting selected amounts of the substance to be screened with the cellular host; and
- (d) measuring the electrophysiological effect current of the substance to be screened on a the TRAAK potassium channel's protein's potassium current expressed by the cellular host, wherein an increase or decrease in potassium current indicates modulation of activation of said TRAAK

potassium channel protein.

~~3~~ <sup>35</sup> (currently amended) A method for screening substances capable of modulating the potassium current of a purified TWIK-related potassium channel (TREK-1) protein which comprises:

(a) transferring a purified nucleic acid sequence represented by encoding <sup>the TREK-1</sup> ~~SEQ ID No: 4~~ potassium channel protein of ~~SEQ ID NO: 4~~ <sup>2</sup>, that which encodes the TREK-1 potassium channel protein, into a cellular host;

(b) culturing the host under conditions for expression of <sup>said</sup> TREK-1 potassium channel protein;

(c) reacting selected amounts of the substance to be screened with the cellular host; and

(d) measuring the electrophysiological effect current of the substance to be screened on a the TREK-1 potassium channel protein's potassium current expressed by the cellular host, wherein an increase or decrease in potassium current indicates modulation of activation of said TREK-1 protein.

Claim 36 (canceled)

37. (currently amended) The method of any of Claims 32-35, wherein said ~~process~~ method screens substances capable of preventing or treating heart disease in mammals.

38. (currently amended) The method of any of Claims 32-35, wherein said ~~process~~ method screens substances capable of preventing or treating central nervous system disease in mammals.

Claims 39-51 (canceled)

~~4~~ <sup>52</sup> (new) A method of screening substances capable of modulating the potassium current

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of an isolated TWIK-related arachidonic acid-activated potassium channel (TRAAK) protein which comprises:

- (a) transferring a purified nucleic acid sequence comprising the sequence between nucleotides 284 to 1477 of SEQ ID NO: 1, ~~or a complement thereof~~, which encodes the TRAAK protein, into a cellular host;
- (b) culturing the host under conditions for expression of TRAAK protein;
- (c) reacting selected amounts of the substance to be screened with the cellular host; and
- (d) measuring the electrophysiological effect of the substance to be screened on the TRAAK protein's potassium current, wherein an increase or decrease in potassium current indicates modulation of activation of said TRAAK potassium channel protein.